ABSTRACT OF THE DISCLOSURE

A method and apparatus for controlling waveguide birefringence by selection of a waveguide core width for a tuned top clad is described herein. A tuned top cladding describes a pre-existing dopant concentration within a top cladding material. Given a tuned top cladding composition, a width of the waveguide core is pre-selected such that birefringence is minimized, i.e., a zero, or near zero. The desirable width of the waveguide core is determined by calculating the distribution of stress in the top cladding over a change in temperature. From this distribution of stress, a relationship between the polarization dependent wavelength and variable widths of the waveguide in the arrayed waveguide grating are determined. This relationship determines a zero value, or near zero value, of polarization dependent wavelength for a given range of waveguide widths. Accordingly, the width of the waveguide may be selected such that the polarization dependent wavelength is minimized.